

Patent Claims

1. A linear displacement system (10) for a base carriage (3) mounted so that it can be displaced freely on a flat floor surface (8), in particular as part of a motion unit (1) for a driving simulator (2) to generate motion impressions for test persons,
 - the linear displacement system (10) comprising a drive unit (12) for controlled pulling and/or pushing of the base carriage (3) relative to the floor surface (8),
 - and the linear displacement system (10) comprising a guide frame (11) which spans the movement space of the base carriage (3) in the movement direction (Y), characterized in that
 - the linear displacement system (10) has a motor carriage (15) which can be displaced freely on the flat floor surface (8) and can be displaced relative to the guide frame (11) with the aid of the drive unit (12),
 - and in that the base carriage (3) is joined to the motor carriage (15) rigidly or via an articulation (16).
2. The linear displacement system as claimed in claim 1, characterized in that the base carriage (3) is mounted relative to the floor surface (8) via air bearings (9) and/or air cushions.
3. The linear displacement system as claimed in claim 1 or 2, characterized in that the motor carriage (15) is mounted relative to the floor surface (8) via air bearings (17) and/or air cushions.

4. The linear displacement system as claimed in one of claims 1 to 3, characterized in that the base carriage (3) is joined to two motor carriages (15, 15') which are arranged offset relative to each other and can both be displaced synchronously with each other relative to the guide frame (11) with the aid of a drive unit (12, 12').

5. The linear displacement system as claimed in one of claims 1 to 4, characterized in that the drive unit (12) is an electromagnetic linear drive (18).

6. The linear displacement system as claimed in claim 5, characterized in that the electromagnetic linear drive (18) is designed as a synchronous drive (19),
- having at least one primary coil (21) integrated in the motor carriage (15),
- and a plurality of permanent magnets (20) integrated in the guide frame (11).

7. The linear displacement system as claimed in claim 6, characterized in that the permanent magnets (20) of the guide frame (11) are configured as flat panels (24) which are aligned in a row along the displacement direction (Y) of the linear drive (18) and are engaged on both sides by two primary coils (21) integrated in the motor carriage (15).

8. The linear displacement system as claimed in one of claims 1 to 7, characterized in that the motor carriage (15) is supported and guided relative to the guide frame (11) with the aid of an air bearing (25).

9. The linear displacement system as claimed in one of claims 1 to 8, characterized in that the base carriage (3) is joined to the motor carriage (3) by a rotary articulation (16).

10. The linear displacement system as claimed in claim 9, characterized in that the rotary articulation is arranged at a height (28) which corresponds to the height of the center of mass of the combination of the base carriage (3) and a load (4, 5, 6) arranged on the base carriage (3).

11. The linear displacement system as claimed in one of claims 1 to 10, characterized in that the base carriage (3) is connected on the opposite side (29) from the motor carriage or carriages (15, 15') via a rotary articulation (32) to a head support (30) mounted so that it can be displaced relative to the floor surface (8).

12. The linear displacement system as claimed in claim 11, characterized in that the head support (30) is supported relative to the base carriage (3) via coupling elements (33).